

CHAPTER VII

DESIGN FUNDAMENTALS

7.1 The Fundamentals of Building Layout

The building functions is to accommodate various kinds of events, help both mentors and start-ups so that they don't have to be nomadic to do mentoring programs, and support networking programs. Concern to that, the open space concept will be more applied than private space. Open space concept is the characteristic implementation of start-up, thus is flexible, and the answer to networking needs. Furthermore, public spaces, especially for external events, will be located separately from the public or private area for regular users so that the circulation of activities is not disturbed.

Green space as a form of application of biophilic design will be placed side by side in each room so that workers can feel the natural atmosphere in every room. The application varies depending on the type of space. The plants used vary, including hanging plants, plants as wall coverings, plants planted with soil media, and plants with aquaponic media. The green spaces will be placed in the middle of the corridor or on the edges.



Figure 7. 1 Hanging Plants

Sources: Instagram @karvonedesign



Figure 7. 2 Hanging Plants



Figure 7. 3 Plants Placed in The Middle of The Corridor

Sources: <https://www.dezeen.com/2013/09/12/pasona-urban-farm-by-kono-designs/>

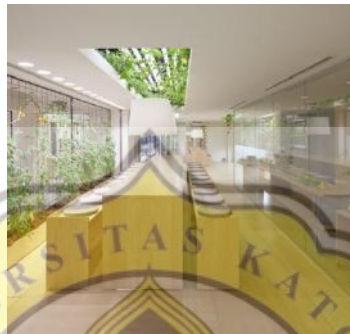


Figure 7. 4 Plants Placed on The Edge of Space

Sources: <https://www.dezeen.com/2013/09/12/pasona-urban-farm-by-kono-designs/>

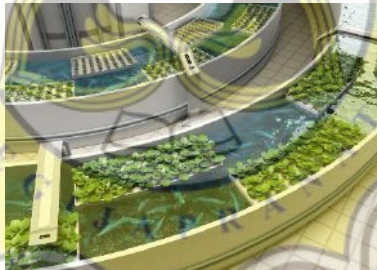


Figure 7. 5 Aquaponic Farming

Sources: <https://www.forbes.com/sites/ariellasimke/2020/04/26/aquaponics-presents-a-new-way-to-grow-sustainable-fish-and-veggies/?sh=3a47fe9fe5f0>



Figure 7. 6 Plants as Wall Coverings

Sources: https://www.boma.org/BOMA/ResearchResources/News/Sustainability_Energy_Management/Green_Walls_A_Growing_Trend.aspx

This Start-Up Centre is organized with the radial organization. The radial organization is a combination of both centralized and linear organizations. The central focal point that linear form radiates from is likened to the lobby, while the line is likened to the corridor that connects to another room/space.

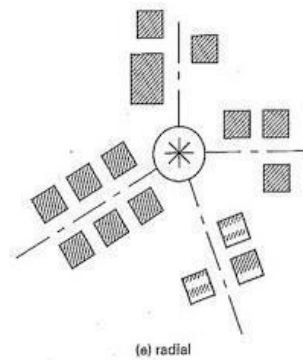


Figure 7. 7 Radial Spatial Organization

Sources: <https://www.arsitur.com/2017/11/pengertian-dan-organisasi-ruang-dalam.html>

7.2 The Fundamentals of Building Form

The principle applied for the start-up centre's building form is the Form Follows Function concept. The building function will be the starting point in the design rather than its aesthetics. That is because the focus of the building function is not to attract visitors. After all, the visitors are fixed and are more concerned with the quality of the inner space. Although adhering to that concept, the building form will still be combined with organic or non-geometric shapes as start-up characteristic's implementation that is not rigid but flexible.

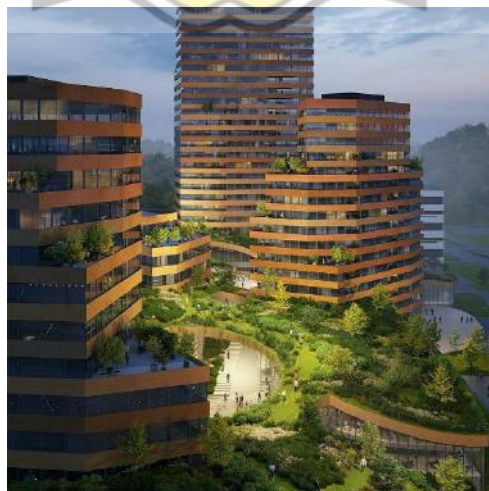


Figure 7. 8 Building Shape Ideas

Sources: Instagram @mvrdrv (Gdynia Park Towers)

7.3 The Fundamentals of Building Structure

7.3.1 Upper Structure

The spaces at the start-up centre will be divided into indoor and outdoor. The different types of spaces will create uneven floor levelling so that the roof cover will also vary. The glass roof covering will be used at a low floor level to enter sunlight as one of the biophilic design applications. At a higher floor level, it will use concrete as a base for the roof garden. At the highest level, it will use concrete for the service area.



Figure 7. 9 Glass Roof Covering

Sources: The Pavilion 388 George Street, 388georgestreet.com.au



Figure 7. 10 Roof Garden

Sources: Instagram @mvrdiv (Gdynia Park Towers)

7.3.2 Super Structure

The superstructure uses a grid system and concrete columns.

7.3.3 Sub Structure

The foundation has an important role as it supports the building above it. The selection of the foundation is determined based on the soil type and its bearing capacity.

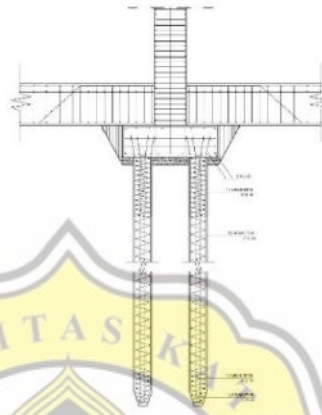


Figure 7. 11 Pile Foundation

Sources: Ilmutekniksipil.com

7.4 The Fundamentals of Building Material

Some of the materials chosen are materials that enhance connection with nature. Minimally processed materials from real nature are preferred because human receptors can tell the difference between real and synthetic. Natural colour and familiar textures that occur within a stone or wood grain pattern will be used a lot in the design.

7.4.1 Floor Covering

Floor coverings will use a combination of ceramics, granite tiles, exposed concrete, and parquet floors. The use of variations adjusts the concept and function of the room. Ceramics and granite tiles were selected because they have many variants and are easy to install, while exposed concrete and parquet floors enhance connection with nature.

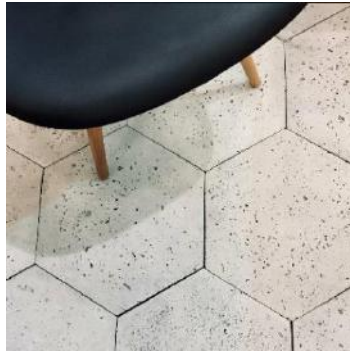


Figure 7. 12 Exposed Concrete

Sources: Instagram @xpose.indonesia

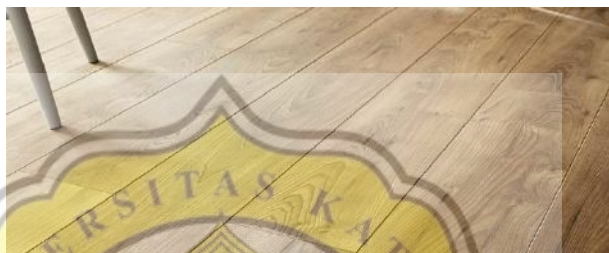


Figure 7. 13 Parquet Flooring

Sources: Dekoruma.com



Figure 7. 14 Ceramic

Sources: Casa39.com



Figure 7. 15 Granite Tile

Sources: pinterest.com

7.4.2 Wall Covering

Wall coverings will use a combination of living walls, ceramics, exposed concrete, stone-textured, wood-textured, carpet, and wall paint. The use of variations adjusts the concept and function of the room. Service rooms will use ceramics, spaces that require soundproofing will use carpets, while living walls, exposed concrete, stone-textured, and wood-textured enhance connection with nature.

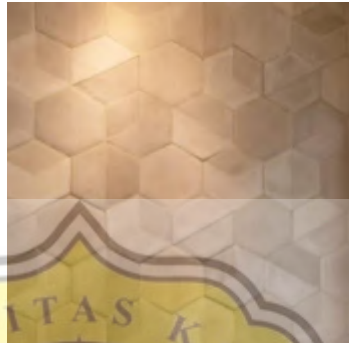


Figure 7. 16 Exposed Concrete

Sources: Instagram @xpose.indonesia



Figure 7. 17 Living Walls

Sources: www.boma.org

7.4.3 Plafond

Covering materials and ceiling types to be used in buildings vary depending on the function of the space. Variations of ceiling materials using kalsiboard and lumber ceiling. The ceiling type itself uses flat ceiling, tray ceiling, and exposed ceiling. Kalsiboard will be used for workspaces and the lumber ceiling will be applied to the hall and library. Then, hollow frames will be used as the ceiling frame.



(a) Flat Ceiling

(b) Exposed Ceiling

(c) Tray Ceiling

Figure 7. 18 Types of Ceiling

Sources: thespruce.com

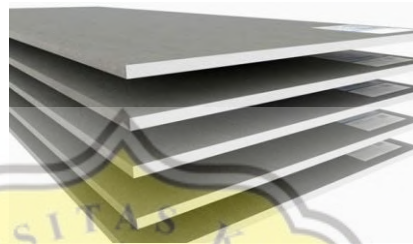


Figure 7. 19 Kalsiboard

Sources: builder.id



Figure 7. 20 Lumber Ceiling

Sources: Rajawali Parquet

7.5 The Fundamentals of Building Façade

The building function is not focused on attracting outside visitors so that the building facade will not be made in contrast but harmonic with the surrounding buildings. The living walls will be used on the building facade to add a greenery look. Then, as the building will use many curtain walls, the perforated shading and light shelves will also be widely used in the design, especially on the side exposed by the sun from the west. This perforated

shading and light shelves at the same time enhances a harmonious impression with other buildings, considering that the surrounding buildings also use secondary skins as they follow green building rules.

7.6 The Fundamentals of Site Layout

The site layout will be arranged according to the function of the outdoor spaces. Security posts will be placed at the entrance and exit. Bus stops and gojek/grab shelters will also be located in the front area near the highway and security post. The outdoor park will be placed in the centre of the site while the building is placed behind. The parking area will be placed in the back of the site.

7.7 The Fundamentals of Building Utility System

7.7.1 Lighting System

The Start-Up Centre will use natural and artificial lighting. However, artificial lighting will be more dominant considering the building functions as an office. Workers need a bright room with the right level of light, so it does not dazzle the eyes. Besides, the urban farming spaces also require special lighting so that plants can grow.

a. Office Area

Downlights were chosen for indoor spaces because of their sleek design and low power consumption.



Figure 7. 21 Downlight Philips Essential SmartBright LED Downlight G2

Sources: <https://www.lighting.philips.co.id>

b. Urban Farming Spaces

A. Light Emitting Diode (LED) Lights

LED lights can produce a greater component of red or blue light with light intensity and spectrum that is more like natural light. The lamp required is 20-40 watts.



Figure 7. 22 GreenPower High Output LED Toplighting

Sources: <https://www.lighting.philips.co.id>

The High Output LED Toplighting delivers very high light output, while radiating much less heat than HPS Toplighting.



Figure 7. 23 GreenPower LED Flowering Lamp

Sources: <https://www.lighting.philips.co.id>

7.7.2 Ventilation and Air Conditioning

The building will use two ventilation systems, the natural and artificial systems. However, artificial ventilation will be more widely used. Semi-outdoor spaces such as the canteen will use the natural ventilation system, while other spaces will use artificial ventilation. Artificial ventilation will use the VRF system.

7.7.3 Power Supply and Electrical Systems

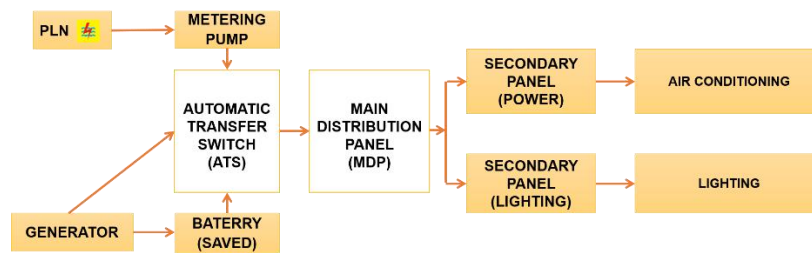


Figure 7. 24 Power Supply and Electrical Systems

Sources: Personal Analysis

7.7.4 Telecommunication Systems

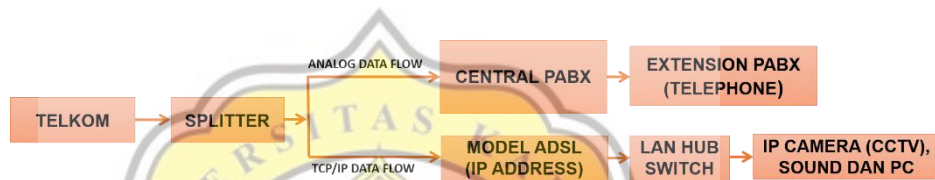


Figure 7. 25 Telecommunication Systems

Sources: Personal Analysis

7.7.5 Water Supply

The clean water supply will be taken from the PDAM and artesian wells. The two sources are used as a form of anticipation. If there is a problem with the PDAM water, the artesian wells will be used, and if the water from the well is receding and cannot meet the cubic needs of use, it will use water from the PDAM. Also, the use of the artesian well is a form of cost savings.

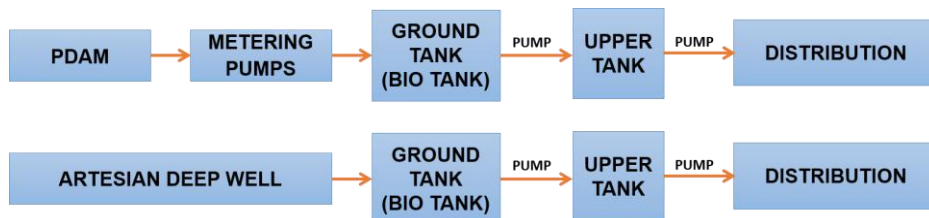


Figure 7. 26 Water Supply Systems

Sources: Personal Analysis

7.7.6 Sewerage Systems

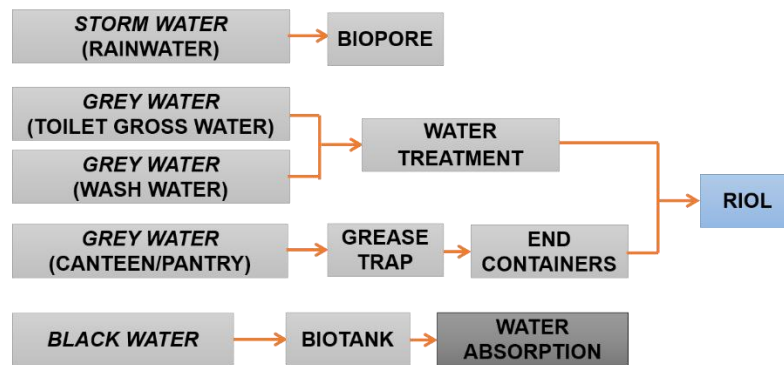


Figure 7. 27 Sewerage Systems

Sources: Personal Analysis

a. Storm Water

Rainwater is water that can be directly absorbed by the soil or directly streamed into city sewers because it does not contain fat or soap. In the project, bio pores will be used to absorb rainwater back into the soil.

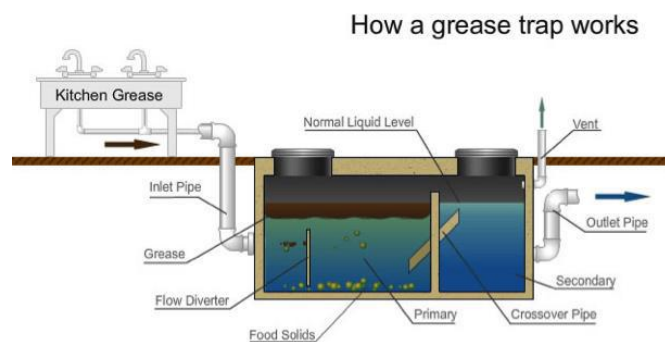
b. Grey Water

i. Toilet Gross and Wash Water

Washing and toilet water are used water from the bathroom sink or floor drain. Used water contains soap, so it should not be distributed directly to the city buildings. Therefore, the water must be treated first before being distributed to the city sewers.

ii. From the Kitchen and Pantry

Used kitchen or pantry water contains fat. Water that's containing fat needs to be separated so that it doesn't clog the channels and pollute the environmental water. Technically, the fat catcher tub will be installed under the sink so that the fat can be caught immediately.



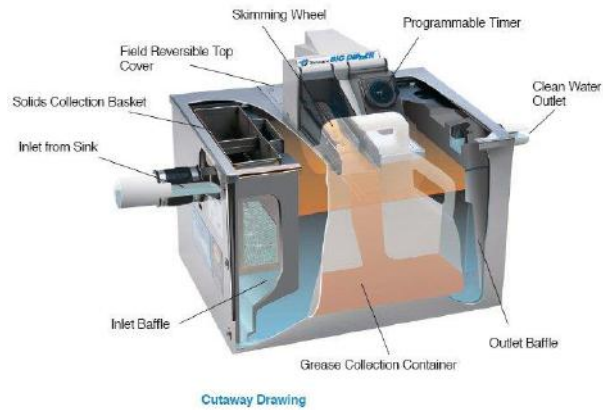


Figure 7. 28 Grease Trap

Sources: plumbingsupply.com

c. Black Water

Blackwater is used water that comes from human waste. The blackwater from human waste will be decomposed in the bio tank.

7.7.7 Fire Protection and Safety

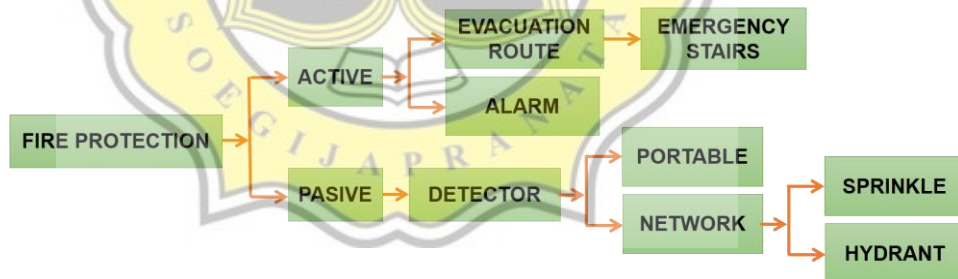


Figure 7. 29 Fire Protection and Safety Systems

Sources: Personal Analysis